

Tooele Chemical Agent Disposal Facility (TOCDF)



Request for a CLASS 2 MODIFICATION to the TOCDF RCRA Permit

Request Number: TOCDF-HTS-02-0993
Request Title: Heel Transfer System for Ton Containers
EPA ID Number: UT 5210090002

For the:

**STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
Division of Solid and Hazardous Waste (DSHW)**

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1. DESCRIPTION OF CHANGE

REGULATORY BASIS AND CLASSIFICATION

This Resource Conservation and Recovery Act (RCRA) Permit Modification Request proposes to modify each of the two Bulk Drain Stations (BDSs, which are Subpart X Miscellaneous Treatment Units) by adding a Heel Transfer System (HTS). The purpose of the HTS is to liquefy a portion of the solid heel layer in Mustard ton containers (TCs) and to transfer the liquified heel (i.e., “rinsate”) to a separate container that is staged at the opposite BDS. In addition to incorporation of the HTS into the RCRA Permit, this mod proposes to establish specific Metal Parts Furnace (MPF) Primary Combustion Chamber (PCC) residence times for the containers that *receive* the HTS rinsate (“Child Containers”) and the TCs wherein the rinsate is *produced* (“Parent TCs”).

Generated by the HTS through addition of heated water directly into the Parent TC, the rinsate is considered the same waste as the Mustard agent itself. Although 40 CFR 270.42 Appendix I does not explicitly address modifications to the Permit for waste variations of this nature, TOCDF proposes to apply conservatively the same Permit modification requirements as though the rinsate is a “different waste...[that] does not contain a POHC that is more difficult to burn than...[Mustard]”. Hence, this modification request is proposed as a Class 2 modification in accordance with 40 CFR 270.42(b) and §270.42 Appendix I, L.6.b., which is incorporated by Utah Administrative Code R315-3-4.3.

BACKGROUND

EG&G Defense Materials, Inc. operates the Tooele Chemical Disposal Facility (TOCDF) for the U.S. Army’s Chemical Materials Agency (CMA), located in Stockton, Utah. The final phase of the project is the elimination of mustard-filled TCs and munitions.

Normal processing of TCs at TOCDF includes draining of the majority of the TC contents at one of the two BDSs to ensure that the post-drain residual amount of agent in the TC is less than the maximum allowable for treatment in the Metal Parts Furnace (MPF). The agent that is drained from the TC is pumped to the Agent Collection System (ACS) for treatment (i.e., incineration) in one of the two Liquid Incinerators (LICs).

Sampling of Mustard TC contents in the Deseret Chemical Depot’s (DCD’s) Area 10 has revealed a portion of the stockpile contains a significant solidified sediment layer commonly called a “solid heel”—a phenomenon also observed in the 155-mm Mustard-filled projectiles. This solid heel layer is not “pumpable” from the TC using the BDS in its current configuration.

1. DESCRIPTION OF CHANGE (continued)

Considering the significant solid heel, in order to achieve the goal of removing a sufficient amount of the TC's contents to render it treatable in the MPF, the BDS needs to be modified. The modified BDSs will be able to remove more of the TC contents than the currently-configured unmodified BDSs. In addition, each of the modified BDSs will have the ability to transfer a portion of the Parent TC's agent to a separate "Child Container" staged at the opposite BDS. The Child Container will also be thermally treated in the MPF.

The ability to sufficiently remove the solid heel from a Parent TC and to transfer a portion of that solid heel to a separate Child Container will enable TOCDF to effectively treat and destroy the Mustard TCs in the stockpile with large solid heels. The BDS modification proposed in this RCRA Permit modification proposal will provide this ability with little impact to TOCDF furnace operating parameters and processes while minimally impacting the physical facility and personnel.

1. DESCRIPTION OF CHANGE (continued)

HEEL TRANSFER SYSTEM DESCRIPTION

Due to the amount of solidification of the TC contents, each BDS needs to be modified to increase its ability to remove Mustard from the TC. Each BDS is to be modified by installing a Heel Transfer System (HTS). The HTS consists of a Rinse and Drain Station (RDS) at each of the BDSs that will 1) effectively “liquefy” some or all of the TC solid heel using a high-pressure, hot-water spray, and 2) transfer the resulting “rinsate” to a separate, initially empty Child Container staged at the opposite BDS RDS. The design of the HTS is based upon information and data gathered during a full scale proof-of-concept test (i.e., treatability study) performed on actual solid heels during the period from October 8, 2007 to October 27, 2007. The final report of the treatability study is included in this proposal at Enclosure 4.1. A draft conceptual Piping and Instrumentation Diagram (P&ID) of the HTS is included as Enclosure 4.2.

The primary components of the HTS are:

- 1) Two Rinse and Drain Stations (RDSs), one at each BDS, consisting of
 - a. A retractable spray wand system, and
 - b. A retractable drain tube system
- 2) Two rinsate transfer pumps and rinsate piping, one for each RDS
- 3) A high-pressure, hot water supply system

Enclosure 4.1 includes a comprehensive description of the treatability study test apparatus which is the basis of the HTS design. The HTS final design is still in the course of preparation, but the key elements of the HTS are the same as the treatability study test apparatus as described in Enclosures 4.1 and 4.2. The design and construction of the HTS is subject to the Facility Construction Certification (FCC) requirements for a Hazardous Waste Management Unit (HWMU), which includes final certification by a qualified, licensed professional engineer.

“CHILD” AND “PARENT” CONTAINER PROCESSING IN THE MPF

Mustard TCs are known to contain both a liquid mustard phase and a solid un-drainable solid phase composed primarily of cyclic sulfonium. TCs are currently categorized and managed as “Baseline TCs” if the concentration of Hg in the liquid mustard phase is less than one part per million (ppm). The liquid mustard phase is drained off at the BDS and transferred to one of two Agent Collection System (ACS) tanks. After draining, the weight of the remaining solid heel is determined using the load cells associated with the BDS. TCs having solid heel weights of 630 pounds or less may be sent to the MPF for thermal processing. TCs having a heel weight in excess of 630 pounds require further processing at the HTS.

HTS operations result in two types of TCs being generated. The TCs from which a portion of heel is removed through the injection of heated high-pressure water are referred to as “Parent” TCs. The containers receiving the water/solid heel slurry removed from the “Parent” TCs are referred to as “Child” Containers.

1. DESCRIPTION OF CHANGE (continued)

This permit modification proposes to process Child Containers through the MPF using a combination of zone timers that, using maximum possible feed rate analysis, result in the Child Containers being processed at a higher agent (i.e., P999 waste) feed rate than Parent TCs. Both Parent TCs having heel weights of <490 lbs and Child Containers having heel weights of <630 lbs are requested to be processed using the same MPF zone and Discharge Air Lock (DAL) times. The purpose of this request is to allow for the development of straightforward process control software, and maximum utilization of the MPF.

Experience has shown that approximately 70 minutes after a 1400 °F child ton container enters the DAL from the PCC Zone 3, the DAL temperature has dropped to approximately 700 deg F. By setting the required DAL residence time at 120 minutes, the DAL temperature will be sufficiently low to ensure that agent monitoring at the DAL is not adversely affected by high temperatures. Hence, the DAL agent monitoring will provide added assurance that the Mustard has been destroyed prior to removing the ton container from the DAL.

1. DESCRIPTION OF CHANGE (continued)

TEMPORARY AUTHORIZATION TO BEGIN CONSTRUCTION ACTIVITIES

Concurrent with this modification request, TOCDF is requesting temporary authorization (TA) pursuant to 40 CFR 270.42(e) to begin “construction” (i.e., installation and testing activities) associated with the BDS HTS prior to the end of the 60-day post-submittal period. The HTSs will not be used for hazardous waste treatment under the requested TA.

§270.42(e)(2)(ii)(A), Activities to be Conducted Under the TA

An HTS RDS will be installed and tested on each of the two BDSs. The installation of the HTS will be certified by a registered Professional Engineer prior to commencement of hazardous waste treatment activities. No hazardous waste treatment will be performed at the HTS under the TA.

§270.42(e)(2)(ii)(B), Necessity of the Temporary Authorization

The HTS will ultimately be used during the treatment of Mustard TCs that have been determined through Area 10 heel-depth measurement to possess a solidified “high-heel”, and hence not sufficiently “drainable” using the current BDSs per this Class 2 RCRA Permit Modification. §270.42(b)(8) implicitly requires that construction (e.g., installation) of the HTS proceed a minimum of 60 days *after* the Class 2 Modification request is submitted for approval. TOCDF desires to proceed with the installation of the HTS *prior to* the end of the 60-day post-submittal period in order to “achieve...the objective [of preventing] a disruption of ongoing waste management activities [at the MPF]”.

§270.42(e)(2)(ii)(C), Continued Compliance to 40 CFR 264 Standards

The HTS consists of several components and assemblies to be attached to each of the two BDSs, which are permitted Miscellaneous Treatment Units. However, the HTS will not be used to perform hazardous waste treatment activities under the TA.

§270.42(e)(3)(ii)(C), Objective of the Temporary Authorization

The objective of the TA is to prevent disruption of ongoing waste management activities. TOCDF is currently within the 155-mm Mustard projectile campaign. The treatment strategy for projectiles includes 100% utilization of the Metal Parts Furnace. TOCDF has chosen the “high-heel” Mustard TCs (as opposed to the 4.2” HT mortars) as the campaign immediately following the current projectile campaign, in part because of time that will be required to retool and modify the Multi-Purpose Demilitarization Machines (MDMs); the MDMs are used for both the projectiles and the mortars. Projectiles, mortars and TCs all require the Metal Parts Furnace for thermal treatment.

1. DESCRIPTION OF CHANGE (continued)

The current 155-mm projectile campaign may finish sooner than originally anticipated due to the fact that the projectile shakedown, trial burn and demilitarization have proven to be somewhat less problematic and time-consuming than expected. In anticipation of an early finish of the 155-mm projectile campaign and the subsequent start of the “high-heel” TC campaign, installation of the HTS needs to begin early in order to prevent a disruption of treatment within the MPF. Without TA to proceed with the installation of the HTS at the currently-idle BDSs, MPF thermal treatment may be delayed unnecessarily by up to 60 days.

1. DESCRIPTION OF CHANGE (continued)

PERMIT LANGUAGE APPROACH

The RCRA Permit language will need to be modified to incorporate the following:

1. Module V “Long-Term Incineration” will be revised to include the minimum PCC zone times and DAL time in the MPF for “Child Containers” <630-lbs (equivalent to the zone times prescribed for “L4” Baseline TCs and Parent TCs).
2. Module VIII “Demilitarization Equipment” will be revised to include the HTS as an available system to effectively remove solid heel material from ton containers.
3. Appendix A will be revised to add a definition for the acronym “HTS”
4. Appendix B will be revised to add a definition for the terms “Parent TC” and “Child Container”
5. Attachment 14 “Demilitarization Equipment” will be revised to include a description of the HTS as part of the existing BDS Subpart X Miscellaneous Treatment Units.
6. Attachment 17 “Equipment Lists” will be revised to include all HTS piping components that will fall under the jurisdiction of 40 CFR 264 Subpart BB.

2. JUSTIFICATION FOR CHANGE

Regulatory Requirements for Subpart X Miscellaneous Treatment Units

40 CFR 264.602 [incorporated by Utah Administrative Code (UAC) R315-8-16], “Monitoring, analysis, inspection, response, reporting, and corrective action – Miscellaneous Units” specifies compliance requirements for the BDSs as miscellaneous treatment units:

“Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies must ensure compliance with §§264.601, 264.15, 254.33, 264.75, 264.77, and 264.101...”

In order to ensure continued compliance, the addition of the HTS equipment at each of the BDSs is evaluated in Table 1 below for its impact to the current means of compliance to 40 CFR 264 Subpart X:

Table 1 - Requirements of 40 CFR 264 Subpart X		
Citation	Title	Impact to the Current Compliance
40 CFR 264.601 Prevention of releases to (a) subterranean, (b) surface, (c) air	Environmental Performance Standards – Miscellaneous Units	The currently-permitted BDSs are located, designed, constructed, operated and maintained in a manner that will ensure protection of human health and the environment. Planned closure activities of the BDS as specified in Attachment 10 of the Permit will not be affected. The addition of the HTS equipment to the BDSs does not adversely impact the ability to protect human health and the environment. 40 CFR 264 Subparts AA and CC and 40 CFR 63 Subpart EEE do not apply to this modification.
40 CFR 264.15	General Inspection Requirements	The BDSs are currently subject to a daily general Environmental Inspection regimen as specified in the RCRA Permit, Attachment 5, Table 5-20 and documented on inspection form D-17. The addition of the HTS equipment to the BDSs does not result in necessary changes to the current inspection regimen.
40 CFR 264.33	Testing and Maintenance of Equipment – Preparedness and Prevention	Facility communications, alarm systems, fire protection equipment, spill control equipment, and decontamination equipment will continue to be tested and maintained in order to assure proper operation in time of emergency. The addition of the HTS equipment to the BDSs does not result in necessary changes to the current testing and maintenance regimen.

2. JUSTIFICATION FOR CHANGE (continued)

Table 1 - Requirements of 40 CFR 264 Subpart X (continued)		
Citation	Title	Impact to the Current Compliance
40 CFR 264.75	Biennial Reporting	Existing reporting requirements will continue to be complied with as specified in the RCRA Permit Modules I & II. The addition of the HTS equipment to the BDSs does not result in necessary changes to the current reporting regimen.
40 CFR 264.76	Unmanifested Waste Reporting	
40 CFR 264.77	Additional Reporting	
40 CFR 264.101	Corrective Action – Releases from SWMUs	Existing corrective action requirements will continue to be complied with as specified in the RCRA Permit Module VII. The addition of the HTS equipment to the BDSs does not result in necessary changes to the current release corrective action regimen.

MPF Feed Rate for Child Containers

The following justification is provided because the proposed revisions to TOCDF RCRA Permit Conditions V.C.1.a.i and V.C.1.a.i.c do not prohibit an MPF charge interval for <630-lb heel Child Containers equivalent to the currently allowed charge interval for <490-lb heel Parent TCs. Note the remaining heel weight in a Parent TC is equivalent to the current maximum heel weight used to characterize a Baseline TCs as a Level 4 (L4) TC.

The processing rate for Child Containers is justified based on the agent feed rate demonstrated during the recent MPF 155mm H Projectile Agent Trial Burn (ATB).

Parent TCs are proposed to be processed at the same rates currently specified for Baseline TCs in Permit Condition V.C.1.a.i, which are rates equivalent to the agent feed rate demonstrated during the MPF HD TC ATB of 256.8 pounds per hour (lbs/hr).

Best case, the proposed feed rate of *Child Containers* is equivalent to a P999 waste feed rate of 303 lbs/hr; calculated as 630 lbs/Child Container * 1 Child Container charged/(120 min max zone time + 5 min tray transfer time) * 60 min/hr = 303 lbs/hr. The agent feed rate demonstrated during the MPF 155mm H Projectile ATB was 371 lbs/hr.

The justification for feeding Child Containers to the MPF weighing up to 630 lbs using feed controlling zone time that is applicable to Baseline and Parent TCs having heel weights of up to 490 lbs is as follows:

2. JUSTIFICATION FOR CHANGE (continued)

- Child TCs contain a water/mustard solids slurry which, based on preliminary testing, contains between 25 to 33 weight percent water and 75 to 67 weight percent mustard solids. The mustard solids fraction of a 630-lbs Child Container's fill will worst case be approximately 473-lbs, which is less than the 490-lbs weight applicable to 120-minute feed controlling zone time currently permitted for L4 TCs (see V.C.1.a.i., and Baseline TCs, L4).
- Mustard liquid and solids are classified as P999 wastes by the Utah Division of Solid and Hazardous Waste (DSHW). The resulting mixture of water and mustard solids contained in the Child Container is also a P999 waste. As previously referenced, the feed rate of P999 waste to the MPF demonstrated during the 155mm H Projectile ATB is greater than the feed rate of P999 waste that will result from feeding 630-lbs Child Containers to the MPF using a feed-controlling 120-minute zone time.
- The proposed maximum charge weight for Child Containers is 630-lbs, which is equivalent to the maximum P999 charge weight of 630-lbs demonstrated during the MPF HD TC ATB which is specified in Permit Condition V.C.1.a.i.
- The permitted feed rates for chlorine and ash cannot be exceeded when feeding 630-lbs Child Containers using a feed-controlling zone time of 120-minutes because the Child Container's P999 waste charge weight is not entirely composed of mustard solids while the feed rate for these parameters were established by feeding charge weights composed entirely of mustard and mustard heels (i.e., 155-mm H projectiles).

2. JUSTIFICATION FOR CHANGE (continued)

IMPACT TO THE TOCDF

The modification and operation of each of the two Bulk Drain Stations (Subpart X Miscellaneous Treatment Units) by the addition of a Heel Transfer System (HTS) station will not adversely impact the ability of TOCDF to protect the human health and the environment.

Environmental Impacts

The key objectives of the BDS treatment will remain the same; the BDS will remove a sufficient amount of agent from the bulk container to render it treatable in the MPF while providing a flow path for combustion air and combustion gases (i.e., opening up the TC interior by punching multiple vent holes). The safe destruction of the agent through thermal treatment (i.e., incineration) in the MPF will continued treatment management strategy using furnace parameters and feed limitations successfully demonstrated via a trial burns. The HTS will add the ability of the BDS to transfer some or all of the contents to a separate vessel in addition to the Agent Collection System (ACS) tanks. The receiving vessel (Child Container) will still be destined for thermal treatment in the MPF as a Mustard-bearing container.

TOCDF Personnel Impacts

Operation of the BDS HTS will be primarily from the central control room (CON) by qualified and certified CON Operators. There will be no significant increase in operations personnel activity as a result of the HTS addition. BDS and MPF Facility Operating procedures will be revised to incorporate operation of the HTS. Additional toxic entries will be necessary to install, test and maintain the HTSs.

Physical TOCDF Impacts

The installation of the HTS stations at each of the BDSs will enlarge the BDS machines resulting in more complex miscellaneous treatment units. The central process computer code will be revised for HTS and MPF operations.

3. PERMIT CHANGE PAGES

Change Pages in Permit Body

Module V

Pages 12 and 13

Module VIII

Page 4

Appendix A

Pages 3 and 5

Appendix B

Pages 1 and 2

Change Pages in Permit Attachments

Attachment 14

Pages 2, 4, 5, 6, 8, 9 and 46

Attachment 17

Pages 2 and 3

Changes to Permit Drawings

None